Applying AI Efforts to Student Assessments: That is, Alternative Innovations!

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Abstract: The integration of Artificial Intelligence (AI) technologies, particularly natural language processing tools (NLPTs), such as OpenAI's ChatGPT©, has gained momentum in North American workplaces due to the COVID-19 pandemic. While NLPTs are lauded for their ability to assist users in thinking, research, and writing, their application in post-secondary institutions, especially among students, poses challenges. Ambiguities in academic integrity policies make it difficult for instructors to assess the authenticity of student work. To effectively coexist with the ethical principles of higher education, NLPTs require careful consideration. This paper explores the implications of NLPTs in teaching and learning, reimagines the role of educators, and presents two sample assessments promoting collaboration, authenticity, and academic integrity. By re-evaluating pedagogical norms and maintaining a humanistic perspective, higher education can embrace AI while upholding its core values.

Introduction

The COVID-19 pandemic has encouraged the development and integration of Artificial Intelligence (AI) technologies in North American workplaces. Natural language processing tools (NLPTs), like OpenAI's ChatGPT©, have gained considerable momentum, applauded for its ability to aid users in thinking, research, and writing processes. In post-secondary institution settings, however, the use of AI/NLPTs is tricky, especially when/if used by students. Many academic integrity policies do not have clear language or concepts around what would constitute proper or improper use of NLPTs. Without clarity, instructors may, for example, find it difficult to determine authenticity in student written assessments. The possible perils of NLPTs cannot and should not be ignored. How can NLPTs effectively co-exist with the basic ethical principles of higher education teaching and learning (e.g., academic integrity)? What does NLPTs mean for the (future) role or value of the educator?

Simply denying or resisting the maturation and use of NLPTs is an impractical solution. Attempting to tackle its drawbacks all at once is an equally futile venture. However, exploring alternative and innovative human-centred practices can help mitigate some of NLPTs' shortcomings, taking advantage of the brilliance the tools can offer higher education teaching and learning processes, while at the same time, ensuring that their use is assumed with dignity and integrity. In many ways, the currently limited NLPTs can become what a calculator is to math in communications and language-based disciplines. This paper presents two sample assessments that encourage authentic teaching and learning experiences, collaboration, and academic integrity. We aim to inspire proactive teaching approaches that value and maintain a humanist mindset and curb the desire to submit to NLPTs in higher education completely.

Evolution of AI in Higher Education

Baker and Smith (2019) define AI as "computers which perform cognitive tasks, usually associated with human minds, particularly learning and problem-solving" (p. 10). They note that AI can encompass a variety of tools and applications, such as data mining or natural language processing. More broadly, AI serves to develop and implement machines that can engage in human-like actions, like learning and correcting (Marchinkowski et al., 2020; Popenici & Kerr, 2017). Although often pegged as a new phenomenon, AI research and application processes date back to the 1950s (Zawacki-Richter et al., 2019). John McCarthy, one of the first researchers interested in AI, noted that a machine is/will be capable of simulating all aspects of human learning and intelligence (Russell & Norvig, 2010). McCarthy's predictions seemingly come to fruition as we observe AI technologies operating in our day-to-day lives (e.g., internet search engines, smartphone apps, household appliances, etc.). AIs consideration in higher

education settings also began some time ago. For example, The International AIEd Society was launched in 1997 and continues to be active today (Zawacki-Richter et al., 2019). Researchers are investing more in discovering its pedagogical potential and pitfalls, while post-secondary institutions are modifying their administrative services according to AI technologies. A Canadian non-profit online learning society, Contact North (2018), has determined that "there is little doubt that the [AI] technology is inexorably linked to the future of higher education" (p. 5).

Applications of AI in Higher Education

Several researchers have categorized the way AI functions in college and university practices (Baker & Smith, 2019; Luckin et al., 2016; Zawacki-Richter et al., 2019). Luckin et al. (2016) identified three areas where AI technologies are being incorporated: a) personal tutoring, b) support for collaborative learning, and c) providing intelligent virtual reality experiences. Zawacki-Richter et al. (2019) added three more categories to this list: a) student profiling and prediction, b) automated assessment and evaluation methods, and c) personalization of curriculum and delivery. Not prescribing to any categories, others have offered additional (sometimes similar) application areas of AI: scheduling student course loads, allocating resources, analyzing teaching, generating texts, and recommending careers, to name a few (Anson, 2022; Marchinkowski et al., 2020; Zeide, 2019). Thinking more broadly, Baker and Smith (2019) represented AI tools as either learner-facing, teacher-facing, or system-facing. In other words, they organized the tools according to whom they serve in the institution. However they are categorized, AI technologies are clearly making waves in post-secondary operations (Zeide. 2019).

Of particular interest is the application of NLPTs. Institutions have been actively involved in NLPTs research and development, establishing dedicated research centers, labs, and departments with industry partners. Applications such as ChatGPT-4©, Transformer©, and Chatbot©, are becoming increasingly popular in post-secondary settings (Anson, 2022; Reich, 2022; Rosenblatt, 2022; Sharples, 2022; Yang & Evans, 2019). Collaborations between tech giants and post-secondary institutions are well underway. For example, the Humber College Institute of Technology and Advanced Learning (2023) partnered with Amazon in 2019 to "modernize" the college's IT infrastructure with the objective of transforming student experiences on campus. NLPTs has been incorporated into curricula and courses, especially those related to computer science, data science, and artificial intelligence. As Anson (2022) noted, "using my access to GPT-3©'s playground, I typed *write an essay about vaccine hesitancy* into a text box. In about four seconds, the system generated [the text]," which was coherent, intelligible, and thoughtfully produced. Yang and Evans (2019) demonstrated the vast capabilities of Chatbot©, simulating natural conversations between users and machines, teaching foreign languages to international students, and supporting peer assessments. Yang and Evans

(2019) also note that NLPTs are leveraged to improve accessibility and inclusion, enabling students to interact with educational materials and systems more effectively. The above-noted applications of NLPTs have encouraged overall optimistic perspectives toward the future of AI in teaching and learning (Quach, 2022).

Other than the perceived benefits of NLPTs, what exactly has accelerated the more recent surge of AI technologies in college and university operations? An obvious reason is ensuring that post-secondary institutions keep up with the tech-driven efforts of workplaces (Anson, 2022; Popenici & Kerr, 2017). It would seem problematic if higher education environments do not model, reflect, or prepare students for the world outside its walls. Another reason for its exponential growth and application is AI serving as an economical solution to the budget losses post-secondary leaders claim to have experienced post-COVID (Popenici & Kerr, 2017). For example, AI technologies can help replace administrative staff who typically undertake repetitive automated tasks (Popenici & Kerr, 2017). The growing trends toward short-term or part-time employment contracts in post-secondary institutions align with the economical solution rationale and aggressive pursuits of AI integration in higher education. The implications that come with the above-noted economic solution are discussed later in the paper.

The current push for democratizing higher education offers another reason for AI's determined entrance/presence in higher education (Popenici & Kerr, 2017). The objective of this goal is to make higher education accessible to all, regardless of space, identity, or any other limiting demographic variable. For example, NLPTs give the opportunity for speakers of other languages enrolled in a Canadian higher education system to be well-supported in their English language learning process (Popenici & Kerr, 2017). Undoubtedly, the economic solution noted earlier helps perpetuate the democratization narrative.

Perhaps the real driver of AI technologies in higher education is the student-as-customer model. Briefly, the student-as-customer model implies that students are paying (tuition) for a service (education) provided by an institution (college or university) operating within a competitive market (Guilbault, 2018; Paricio, 2017). In a position to demand, students/customers expect services to conform to their needs: "their priorities and expectations become the benchmark of quality on which to model and reorient the institution's activity" (Paricio, 2017). Interestingly, the student-as-customer paradigm has gained momentum alongside AI and NLPT's increased application in higher education practices. As these technologies continue to improve in functionality and intuition, the paradigms or discourses that define higher education will likely shift.

The student-as-customer is already using NLPTs or AI more broadly on their assignments and work. This matters because institutions (such as Humber College, 2023) are already behind in having clear mandates and discussions across departments, faculty, and administration about what the

legitimate use of AI/NLPTs should look like, as mentioned earlier in the paper. It can also apply differently to different disciplines and programs. It is a guarantee that AI and its daily applications will only grow from this point, and education is already being forced to grow and innovate with it.

Drawbacks of AI in Higher Education

Despite the marked acceleration and benefits of AI/NLPTs in higher education, time and effort have been invested in determining their drawbacks (Popenici & Kerr, 2017). Table 1 lists these drawbacks, as noted in recent literature. Researchers focused on the pitfalls of AI in higher education applications appear uneasy and threatened by the concept:

Despite rapid advancements in AI, the idea that we can solely rely on technology is a dangerous path, and it is important to maintain focus on the idea that humans should identify problems, critique, identify risks, and ask important questions that can start from issues such as privacy, power structures, and control to the requirement of nurturing creativity and leaving an open door to serendipity and unexpected paths in teaching and learning. (Popenici & Kerr, 2017, p. 3)

Table 1

Drawbacks of AI in Higher Education

Unable to solve complex endeavours of human-learning
Unable to redirect difficult questions asked by students
Unable to recognize the feelings/emotions of users during conversations
Leads to violations of student conduct codes
Threatens academic integrity
Creates (fear of) job loss – "bots" replacement of teachers, staff, tutors, etc.
Threatens user privacy and data protection
Limits control and authority to varied agents – invisible infrastructure
Performs in complex, non-comprehensible ways
Produces algorithmic biases – mirroring discriminatory information
Inaccessible to all (e.g., functions poorly for dark-skinned individuals)
Encourages narrowly defined goals for teaching and learning
Promotes rushed curriculum development
Draws attention to (unwanted) institutional limitations (e.g., directing a student to support services that are not physically available)
Reduces students' ability to think critically and for themselves
Replaces all useful, traditional forms of assessment

Notes. Anson, 2022; Popenici & Kerr, 2017; Quach, 2022; Rosenblatt, 2022; Sharples, 2022; Yang & Evans, 2019; Zawacki-Richter et al., 2019; Zeide, 2019

The above Table identifies a few functional shortcomings of AI (Anson, 2022; Yang & Evans, 2019; Zawacki-Richter et al., 2019). Unsurprisingly, researchers who have pointed out issues with functionality often add a caveat that these are likely to resolve soon, such as in Osbourne (2023), where a Princeton Student introduced a pilot AI tool to combat NLPTs-induced plagiarism. Of course, there still needs to be clear discussion of whether using NLPTs actually constitutes plagiarism. The more serious drawbacks of AI's application in higher education seem to do with the pedagogical, ethical, social, etc., implications that come with it rather than its functionality or the technology itself (Zawacki-Richter et al., 2019). The horizon of opportunities offered through AI should not eclipse the detrimental effects its application may bring to teaching and learning. As Anson (2022) put it, these systems "may seem acceptable for mundane and repetitive tasks, especially in a work context. But where does acceptability end?"

AI, including NLPTs, carries no consciousness or self-reignition, currently. These are simply programs that can edit and change independently through machine learning. This means that they can do useful work, but also suffer several limitations and must be taught by the users how to be the most effective tools. One must have strong critical skills to train NLPTs to produce effective results for them. Another important aspect is that machine learning occurs without the original program writers knowing how or why the NLPTs will process and learn the way it does.

Some of these elements alone should give pause and reflection about how quickly we want to integrate AI into our lives, and careful consideration of how it will be regulated and approached now and in the future. Such issues were not effectively considered before social media became a cultural norm, and now many wish it had been pondered more. Some argue that the outcomes of its application in higher education cannot really be determined yet, but will likely remain a topic of interest over the next decade or two (Zawacki-Richter et al., 2019). In our opinion, we have a very small window to try and avoid similar mistakes in relation to AI.

Moving Forward with AI in Higher Education

Moving forward with AI/NLPTs in higher education *does not* entail abandoning all conventional modes and ideologies of teaching and learning, nor completely denying its existence. Rather, it can be seen as another aspect of a complex system, one that can encourage educators, practitioners, administrators, etc., to envision new paradigms shaped by innovation, engagement, and creativity (Anson, 2022; Popenici & Kerr, 2017). Moving forward with AI in higher education means embracing novelty, but at the same time, helping students navigate through its strengths and weaknesses (Anson, 2022). That said, how can we harness its potential in higher education wisely or sensibly? (Sharples, 2022).

Considering the unknowns and drawbacks that currently surround AI technologies, researchers have pointed out several requirements to move

forward successfully and responsibly with AI in higher education (Quach, 2022; Reich, 2022; Zawacki-Richter et al., 2019; Zeide, 2019). An important requirement is addressing the ethical implications that surround AI in higher education: "The solution lies in getting technology companies and the community of AI developers to embrace an ethic of responsibility" (Reich, 2022). In the UK, the Institute for Ethical AI in Education was established to ensure AI applications within higher education remain ethical (Zawacki-Richter et al., 2019). Institutions like these can help prevent and mitigate any harmful effects that arise with AI technologies (Reich, 2022). Strong guidelines and clear frameworks on how and when to incorporate AI, like NLPTs, in teaching practices without compromising democratic and academic integrity are needed (Quach, 2022; Reich, 2022). For example, "all text generated by commercially available language models could be placed in an independent repository to allow for plagiarism detection" (Reich, 2022). Transparency with data collection and uses is also warranted (Pedró et al., 2019). Ensuring that AI tools effectively promote inclusion and equity, and that teachers are prepared (mentally and physically) to deliver AI-driven education are other components that can carry ethical implications and require attention (Pedró et al., 2019).

In addition to ethics, moving forward with AI also requires re-evaluating, confirming, shifting, etc., the pedagogical norms currently valued in higher education. As observed by Schleicher (2015), "innovation in education is not just a matter of putting more technology into more classrooms; it is about changing approaches to teaching so that students acquire the skills they need to thrive in competitive global economies" (p. 7). Castañeda and Selwyn (2018) argue that the human component of digital technology use should always be acknowledged and remain at the fore when applied to higher education. Maintaining a humanistic perspective in higher education can reduce the "cold technocratic imperative" that seems to define AI technologies (Bayne, 2015, p. 8). To sustain the human component, educators may be required to think more creatively when developing assessments (Quach, 2022). Looking specifically at English and Composition Courses,

> the onus now is on writing teachers to figure out how to get to the same kinds of goals that we've always had about using writing to learn… engaging [students] with ideas, teaching them how to formulate thoughts [and] communicate clearly or creatively. I think all of those things can be done with AI systems, but they'll be done differently. (Quach, 2022).

For example, educators can have students produce an essay using NLPTs and then have them re-write the essay from a different perspective (Sharples, 2022). The ethical or pedagogical implications that come with AI may never fully resolve, especially as technologies continue to grow and advance. Alternative and innovative human-centered practices can help mitigate some of AI's shortcomings and implications, without completely casting aside its advantages as a tool.

A large part of the conversation around integrating AI while maintaining human-centered teaching and learning should consider the principles of Universal Design for Learning (UDL). UDL guidelines have framed teaching and learning environments since its evolution in the mid 1980s (Thibodeau, 2021). The objective of UDL is to provide all learners with access to meaningful learning experiences (CAST, 2018). UDL encourages multiple means of engagement (recruiting interest, sustaining effort and persistence, and self-regulation), multiple means of representation (perception, language and symbols, and comprehension), and multiple means of expression (physical action, expression and communication, and executive functions) (CAST, 2018). Aligning AI technologies with UDL principles can help ensure that higher education settings are moving forward with AI in a productive, ethical, and pedagogically-sound fashion.

Alternative and Innovative Human-Centered Assessments

The purpose of this paper is to present two sample assessments that can encourage authentic teaching and learning experiences, collaboration, and academic integrity, without relying on AI/NLPTs. We are not suggesting that teaching and learning practices should always negate the use of NLPTs, or that these tools cannot be integrated into the sample assessments we present. Rather, our goal is to share assessments that move away from traditional "pen and paper testing" styles, but without necessarily using or relying on NLPTs or other AI. Through the sample assessments provided, we hope to remind educators that innovation still exists outside of technology.

Context

We, Erik and Maria Lucia (Marylou), are professors in the Faculty of Liberal Arts and Sciences at the Humber College Institute of Technology and Advanced Learning (Humber College). Erik is a contract professor in the General Arts and Sciences Program Department, while Marylou is a full-time professor in the English Department. We have been teaching at the institution since 2011. Humber released their 2023-2026 Academic Plan earlier this year. Priority 2 of this plan is *Personalizing the Learning Journey (*Humber College Institute of Technology and Advanced Learning, 2023). The actions listed under this priority include offering a wide range of course delivery options (e.g., virtual, hybrid) and harnessing emerging technologies, such as augmented reality (Humber College Institute of Technology and Advanced Learning, 2023). According to this plan and its priorities, AI technologies will undoubtedly play a strong role in shaping future teaching and learning practices at the institution.

Sample 1

GCOM 220; Writing for the Sciences 2 is designed to develop reading, research, analysis, writing, and communication skills for students

who plan to enter health science programs in the future. Students learn how to summarize and identify key pieces of information from articles and arguments, and they learn how to analyze the quality and construction of arguments. These skills are then built upon for students to develop and present their own arguments in different formats with attention to the method of compare and contrast arguments.

One of the assignments for the course asks students to work in groups and prepare a presentation. The topic of the presentation is for them to select a film, story, or TV show that portrays healthcare or healthcare work in some way. They are asked to assess and analyze how accurate the portrayal is of procedures, conditions, and work environment to conditions in real experiences of these careers. They are also asked to evaluate and analyze the financial, ethical, and legal dilemmas around healthcare as such contexts pertain to their chosen text.

This assignment helps to develop the skill sets that are a part of the course learning outcomes and it aims to offer an engaging and entertaining way for students to utilize the skills and report back their findings to the rest of the class. The choice of analyzing primarily a visual text such as film limits the use of NLPTs in completing an analysis; instead, it can only operate as an aid to research and thinking. Also, it cannot produce results as the assignment must be delivered as a collaborative presentation whether that be orally in person, done virtually through a learning platform, or as a recorded video.
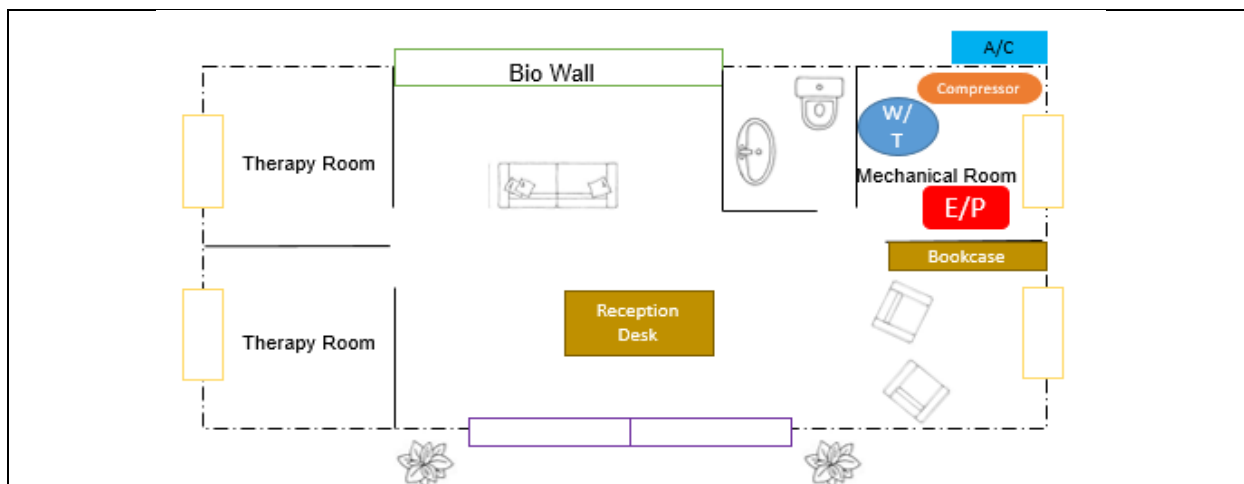
Sample 2

WRIT108: English 1 for Skilled Trades is designed to develop the reading, research, and writing skills of students in the skilled trades program. Skilled trades include electrical, plumbing, landscape, welding, millwright/machinist, woodworking, building/renovation, cabinetry, HVAC (heating, ventilation, and air conditioning), and carpentry. Students learn how to construct documents for varied audiences and purposes. They learn how to gather and synthesize relevant data from technical documents and then communicate their understanding in writing. Students gain familiarity in completing work orders, quotations, contracts, part/process description reports, and instruction manuals with accuracy, conciseness, and professionalism.

The final assessment for this course is a cumulative project weighted at 25%. The assessment is described below:

Healthcare and Wellness Facility Development Project	
Project Description	**Skilled Trades Assigned to the Project**
Scientific advances in healthcare have been disproportionately distributed across social strata. The City of Toronto has committed to building a new healthcare and wellness facility	- HVAC - Landscape, Arboristry, Horticulture, & Urban Arboriculture

dedicated to serving low-income, marginalized communities. Your contracting company, *Humber Hands Contracting Co.*, has been selected to construct the facility!	• Building, Construction, & Renovation • Cabinetry, Carpentry, & Woodworking • Electrical • Millwright & Mechanics • Plumbing • Welding
Project Details	
Requester Ministry of Development, City of Toronto 456 Bay St., Toronto Project Organizer: William Paljeet William.paljeet@cityoftoronto.com	*Contractor* Humber Hands Contracting Co. 110 Humber College Blvd., Toronto Humberhandscontractingco@gmail.com
Start Date May 5th, 2023	*Expected Completion Date* May 5th, 2024

Job Requirements for each Skilled Trade

- HVAC: Install an Air Conditioning Installation
- Landscape, Arboristry, Horticulture, & Urban Arboriculture: Construct Bio Wall and Front Door Planters
- Building, Construction, & Renovation: Frame the walls of 2 Therapy Rooms, 1 Bathroom, and 1 Mechanical Room
- Cabinetry, Carpentry, & Woodworking: Build a Bookcase and Reception Desk
- Electrical: Wire/Bring power to 1 light socket in each Therapy Room, 1 light socket in the Mechanical Room, 1 light socket in the Bathroom, and 3 light sockets in the Main Room
- Millwright & Mechanics: Install/Set Up a compressor in the Mechanical Room
- Plumbing: Plumb a sink and toilet in the Bathroom
- Welding: Weld the metal structure of the building's perimeter

Facility Layout

Facility to be located on 657 Finch Ave., Toronto

Project Instructions for Students – What you have to complete	
Steps	Deliverable Weight & Due Date
1. Organize yourselves in groups according to skilled trade (i.e., electricians in one group, plumbers in another). 2. As a group, review the project details and requirements of your skilled trade. 3. As a group, develop a **work order** based on your trade project responsibilities. You can choose one of the work order templates distributed earlier in the semester. You may need to do some research and be creative to complete some areas. 4. Individually, choose ONE tool that is required to complete your trade project work (e.g., drill), and develop a **parts description** (visual and labels). Please consider the criteria included in a parts description as learned earlier in the semester. 5. As a group, develop an **instructions document** that notes the first 5 steps/directions of your trade project work. Please consider the criteria included in instructions documents as learned earlier in the semester. 6. As a class, we will combine all work orders, parts descriptions, and instructions documents to create a Project Portfolio.	A **Work Order (10%)** completed as a group **DUE**_____ A **Parts Description (5%)** completed per student **DUE**_____ An **Instructions Document (10%)** completed as a group **DUE**_____

Like the first sample, the second assessment also carries a group work element, which can encourage authentic interaction between peers and limit the complete use of AI tools. The assessment overall is based upon a fictional (instructor-created) health facility blueprint. Students are required

to complete the given deliverables (work order, parts description, etc.) based on a project that does not actually exist, which again limits the complete use of AI/NLPTs to complete the task. A more in-depth discussion about both assessment samples is provided below.

Discussion and Implications for Teaching and Learning

Whether it is to attract more students or cut down on costs, AI's integration into higher education is progressively transforming the way teachers teach and learners learn. Currently, best practices in AI for higher education are determined by perceptions only (Jackson et al., 2011). Alongside the many advantages of AI in teaching and learning, the existing drawbacks are undeniable. Many view characteristics of AI, specifically NLPTs, as a certain threat to higher education learning, especially in courses about writing, thinking, analyzing, communicating, etc. (Anson, 2022). Post-secondary institutions, both management and faculty, now face the challenge of maintaining an education system that embraces the positive features of AI, without compromising "the fundamental aspects of the student's intellectual and personal development, which is so essential in advanced democratic societies" (Ballard, 2004, p. 23). This challenge, or opportunity, carries implications for future teaching and learning.

The assessments pictured earlier in the paper carry a formal structure to them, but also the flexibility to allow for strong engagement, representation, and expression, aligning well with UDL guidelines. By offering options and choice around the details and points of focus in the assignments (e.g., showing episode or film selection/trade area focus and tools), interest is recruited. NLPTs or AI in general can serve as a supplemental means "to contribute to collaborative learning by supporting adaptive group formation," needed in both given assignments (Zawacki-Richter et al., 2019, p. 4). However, to rely on it completely for collaborative purposes, students would lose out in physical action, executive functions, expression and communication, and self-regulation. All these skill sets are required to operate effectively as a group and produce completed documents or presentations, while also mimicking the working world setting that these kinds of tasks and projects bring. The students also get the chance to work with perception, language and symbols, and comprehension while they are putting together their documents or creating slides for the presentations. Finally, the assignments also require sustained effort and persistence to complete them and work through the stages and process of the expectations, contrary to the "quick time" or "just-in-time" methodology of NLPTs and other AI systems (Zeide, 2019).

In addition to UDL, these assessment designs encourage students to develop their analytical skills. NLPTs can only process textual information and cannot offer analysis of visual or spatial elements. These systems generate information based on what humans have already produced, which means inaccurate, discriminatory, stereotypical, unanalyzed, and unfiltered data can be represented (Anson, 2022). While NLPTs or AI may be used to

assist in research, it will not be able to put together a final and completed project like the samples provided. The design of the assignments only allows AI to be used in limited ways, as an assistive tool, and student attempts to complete the projects with AI will not be effective. NLPTs' goal is to reduce information based on developer interpretations and instructions (Zeide, 2019), while the goal in these assignments is to expand and build ideas, writing, documentation, deliverables, etc. AI would simply act as a learning exercise for students to recognize its limitations if used to complete the subject assignment(s).

Another learner advantage of these types of assignments and learning designs is they can make a course more student-centered and customizable. Authentic student-centered teaching and learning puts the student in charge of what, why, and how they learn. With AI, teaching and learning processes operate through machine-centered approaches, as Quach (2022) suggests with students simply parroting AI's expressions. An important aspect of student-centered teaching and learning is customizing curriculum. Interestingly, some have argued that AI has the potential to personalize curriculum content (Zawacki-Richter et al., 2019). However, this kind of personalization exists within certain algorithmic and predictive parameters. The complexities or nuances of student learning styles, programs, courses, curricula, etc., are best captured through in-person interactions, such as those demonstrated in the sample assignments (Zeide, 2019).

Looking at implications for instructors in particular, the samples provided in this paper call for more involved task development and evaluation. Instructors are encouraged to craft teaching and learning experiences that allow students to formulate their own thoughts and produce authentic deliverables (Anson, 2022; Popenici & Kerr, 2017). AI can serve as a tool that supplements lesson and task development, while keeping in mind the human aspects of technology and learner pedagogy (Castañeda & Selwyn, 2018, p. 21). With evaluation, AI's method is very much automated and based on coded/quantifiable measures, which would not work for the sample assignments as students are given a variety of choices (Zawacki-Richter et al., 2019). And what happens when/if "algorithmic evaluations or recommendations do not align with their [instructor's] professional judgment?" (Zeide, 2019). As Sharples (2022) put it, "nobody learns, nobody gains" when students and teachers rely solely on AI with assessments (p. 2).

There are several limitations to the kind of alternative assessment creations for which we are advocating. Innovative assessment design assumes that instructors take on the workload of developing compelling tasks, which also likely requires more time in planning courses and syllabi in ways that align with UDL and human-centered teaching and learning pedagogies. Like with most innovative ventures in higher education, collaborative efforts between faculty, innovation teams, and administrators can help curb/disperse some of the time and workload. However, such

ventures depend on money/budget. More robust compensation will need to be invested by institutions to, a) provide professional development and training on how to build innovative assessments in ways that can incorporate NLPTs or AI without compromising academic integrity, b) access resources to create more innovative and contemporary curriculum materials, and c) assign persons who can evaluate the efficacy and sustainability of implemented alternative innovations.

AI-centered teaching and learning requires little time, workload, or money, which is what makes it so desirable for higher education applications. We have entered a new educational frontier, and as we stressed earlier, there is a small window of opportunity where we can lay a foundation to navigate it effectively. The human-centered assignments presented in this paper are small examples of solutions to what may become very big concerns with AI in higher education.

Note1: We use the terms AI and NLPTs interchangeably at times, depending on the context.

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Conflict of Interest
The authors declare no conflict of interest.

References

Anson, C. M. (2022). AI-based text generation and the social construction of "fraudulent authorship": A revisitation. *Composition Studies*, *50*(1), 37+. https://link-gale-com.ezproxy.humber.ca/apps/doc/A712176368/AONE?u=humber&sid=bookmark-AONE&xid=ca10c2f8

Baker, T., & Smith, L. (2019). Educ-AI-tion rebooted? Exploring the future of artificial intelligence in schools and colleges. *Nesta Foundation.* https://media.nesta.org.uk/documents/Future_of_AI_and_education_v5_WEB.pdf

Ballard, J. D. (2004). Academic standards and grade inflation: Easily forgotten structural aspects of the equation. *Phi Kappa Phi Forum, 84*(4), 23

Bayne, S. (2015). Teacherbot: Interventions in automated teaching. *Teaching in Higher Education*, *20*(4). doi:10.1080/13562517.2015.1020783.

CAST (2018). *Universal Design for Learning Guidelines version 2.2.* http://udlguidelines.cast.org

Castañeda, L., & Selwyn, N. (2018). More than tools? Making sense of the ongoing digitizations of higher education. *International Journal of Educational Technology in Higher Education*, *15*(22). https://doi.org/10.1186/s41239-018-0109-y

Contact North (2018). *About Contact North, Contact Nord.* https://contactnorth.ca/about-us

Guilbault, M. (2018). Students as customers in higher education: The (controversial) debate needs to end. *Journal of Retailing and Consumer Services, 40,* 295-298. https://doi.org/10.1016/j.jretconser.2017.03.006

Humber College Institute of Technology and Advanced Learning (Humber College) (2023, January). *Transforming the future of education with artificial intelligence and machine learning.* https://humber.ca/academic-division/blog/artificial-intelligence-machine-learning

Jackson, M. J., Helms, M. M., & Ahmadi, M. (2011). Quality as a gap analysis of college students' expectations. *Quality Assurance in Education, 19*(4), 392-412.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence unleashed - an argument for AI in education.* http://discovery.ucl.ac.uk/1475756/

Marchinkowski, F., Kieslich, K., Starke, C., & Lunich, M. (2020). Implications of AI (un-)fairness in higher education admissions: the effects of perceived AI (un-)fairness on exit, voice, and organizational reputation. *Proceedings of the 2020 Conference on Fairness, Accountability, and Transparency*, 122-130. https://doi.org/10.1145/3351095.3372867

Osbourne, M. (2023, January). Student creates app to detect essays written by AI. *Smithsonian Magazine.* https://www.smithsonianmag.com/smart-news/student-creates-app-to-detect-essays-written-by-ai-180981463/

Paricio, J. (2017). Students as customers: a paradigm shift in higher education. Debats. *Journal on Culture, Power and Society, 131*(3), 137-149. http://dx.doi.org/10.28939/iam.debats-en.2017-11

Pedró, F., Subosa, M., Rivas, A., & Valverde, P. (2019). *Artificial intelligence in education: Challenges and opportunities for sustainable development*. Paris: UNESCO.

Popenici, S.A.D., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. *RPTEL, 12*(22). https://doi.org/10.1186/s41039-017-0062-8

Quach, K. (2022, December). University students recruit AI to write essays for them. Now what? *The Register*. https://www.theregister.com/2022/12/27/university_ai_essays_students/

Reich, R. (2022, November). Now AI can write students' essays for them, will everyone become a cheat? *The Guardian*. https://www.theguardian.com/commentisfree/2022/nov/28/ai-students-essays-cheat-teachers-plagiarism-tech

Rosenblatt, K. (2022, December). New bot ChatGPT will force colleges to get creative to prevent cheating, experts. *NBC News*. https://www.nbcnews.com/tech/chatgpt-can-generate-essay-generate-rcna60362

Russell, S.J, & Norvig, P (2010). *Artificial intelligence: a modern approach*, (3rd ed.). Upper Saddle River: Prentice-Hall.

Schleicher, A. (2015). *Schools for 21st-century learners: Strong leaders, confident teachers, innovative approaches*, *international summit on the teaching profession*. Paris: OECD Publishing.

Sharples, M. (2022, May). New AI tools that can write student essays require educators to rethink teaching and assessment. *Impact of Social Sciences Blog*. https://eprints.lse.ac.uk/116271/

Thibodeau, T. (2021). *The Science and Research Behind the UDL Framework*. https://www.novakeducation.com/blog/the-science-and-research-behind-the-udl-framework

Yang, S., & Evans, C. (2019). Opportunities and challenges in using AI Chatbots in higher education. *ICEEL 2019: Proceedings of the 2019 3rd International Conference on Education and E-learning*, 79-83. https://dl.acm.org/doi/abs/10.1145/3371647.3371659

Zawacki-Richter, O., Marín, V.I., Bond, M. et al. (2019). Systematic review of research on artificial intelligence applications in higher education – where are the educators? *Int J Educ Technol High Educ, 16*(39). https://doi.org/10.1186/s41239-019-0171-0

Zeide, E. (2019). Artificial intelligence in higher education: Applications, promise and perils, and ethical questions. *Educause Review*, *54*(3). https://ssrn.com/abstract=4320049